

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) An X-ray detector, comprising:
a photoelectric converting section of a pixel unit,
scintillator pixels containing a fluorescent material I formed on individual pixels of the photoelectric converting section, and
a partition containing a fluorescent material and/or a nonfluorescent material disposed between the scintillator pixels,
wherein, when an average particle diameter of the fluorescent material I is $\overline{D_s}$, $\underline{D_s}$ and an average particle diameter of the fluorescent material and/or the nonfluorescent material is $\overline{D_w}$, $\underline{D_s} > \overline{D_w}$ is satisfied.
2. (Original) The X-ray detector according to claim 1, wherein, when a thickness of the scintillator pixels is T_s , an average particle diameter of the fluorescent material I in the scintillator pixels is $\overline{D_s}$, and a packing density of the fluorescent material I within the scintillator pixels is F_s , $\underline{D_s} \geq T_s \bullet F_s / 10$ is satisfied.
3. (Currently Amended) The X-ray detector according to claim 1 or 2, wherein, when a thickness of the partition is T_w , an average particle diameter of the fluorescent material and/or the nonfluorescent material within the partition is $\overline{D_w}$, and a packing density of the fluorescent material and/or the nonfluorescent material within the partition is F_w , $\overline{D_w} \leq T_w \bullet F_w / 10$ is satisfied.

New National Phase Application of Kenichi ITO et al.

4. (Original) The X-ray detector according to claim 3, wherein the scintillator pixels containing the fluorescent material I are formed of a sintered body of the fluorescent material I.

5. (Currently Amended) The X-ray detector according to ~~any of claims 1 to 4~~ claim 1, wherein the partition contains a fluorescent material II which has optical characteristics different from those of the fluorescent material I contained in the scintillator pixels and the longest wavelength of fluorescent light equal to or longer than the shortest wavelength of fluorescent light of the fluorescent material I.

6. (Currently Amended) The X-ray detector according to ~~any of claims 1 to 4~~ claim 5, wherein the partition contains a fluorescent material III which has optical characteristics different from those of the fluorescent material I contained in the scintillator pixels and the shortest wavelength of fluorescent light equal to or shorter than the longest fluorescence excitation wavelength of the fluorescent material I.

7. (Currently Amended) The X-ray detector according to ~~any of claims 1 to 6~~ claim 1, wherein the fluorescent material I ~~is a fluorescent material having~~ comprises $\text{Gd}_2\text{O}_2\text{S}$ or CsI as a base material.

8. (Currently Amended) The X-ray detector according to ~~any of claims 1 to 6~~ claim 6, wherein the fluorescent material II or the fluorescent material III ~~is a fluorescent material having~~ comprises $\text{Gd}_2\text{O}_2\text{S}$ as a base material.

New National Phase Application of Kenichi ITO et al.

9. (Currently Amended) The X-ray detector according to claim 6 ~~or 8~~, wherein the longest wavelength of fluorescent light of the fluorescent material III is in an ultraviolet region.

10. (Currently Amended) A method for producing ~~the an~~ X-ray detector ~~according to any of claims 1 to 9, comprised of forming scintillator pixels on a photoelectric converting section of a pixel unit and forming a partition between the scintillator pixels, the method comprising a photoelectric converting section of a pixel unit, scintillator pixels containing a fluorescent material I formed on individual pixels of the photoelectric converting section, and a partition containing a fluorescent material and/or a nonfluorescent material disposed between the scintillator pixels, wherein, when an average particle diameter of the fluorescent material I is D_s and an average particle diameter of the fluorescent material and/or the nonfluorescent material is D_w , $D_s > D_w$ is satisfied, the method comprising:~~

forming a layer containing a the fluorescent material I on the photoelectric converting section of the pixel unit;

forming the scintillator ~~pixel pixels~~ by removing a portion, ~~which is to be the partition,~~ from the layer; and

forming the partition by filling a material containing a fluorescent material II and/or a fluorescent material III into the portion removed.

11. (Currently Amended) A method for producing ~~the an~~ X-ray detector ~~according to any of claims 1 to 9, comprised of forming scintillator pixels on a photoelectric converting section of a pixel unit and forming a partition between the scintillator pixels, the method comprising a photoelectric converting section of a pixel unit, scintillator pixels containing a fluorescent material I formed on individual pixels of the photoelectric converting section, and~~

a partition containing a fluorescent material and/or a nonfluorescent material disposed between the scintillator pixels, wherein, when an average particle diameter of the fluorescent material I is D_s and an average particle diameter of the fluorescent material and/or the nonfluorescent material is D_w , $D_s > D_w$ is satisfied, the method comprising:

forming a layer containing a fluorescent material II and/or a fluorescent material III on the photoelectric converting section of the pixel unit;

~~forming the partition by removing a portion other than the portion, which becomes the partition, from the layer; and~~

forming the scintillator pixels by filling the portion removed ~~in the partition forming step~~ with a material containing the fluorescent material I.

12. (Currently Amended) A method for producing ~~the an~~ X-ray detector according ~~to any of claims 1 to 9, comprised of forming scintillator pixels on a photoelectric converting section of a pixel unit and forming a partition between the scintillator pixels, the method comprising~~ a photoelectric converting section of a pixel unit, scintillator pixels containing a fluorescent material I formed on individual pixels of the photoelectric converting section, and a partition containing a fluorescent material and/or a nonfluorescent material disposed between the scintillator pixels, wherein, when an average particle diameter of the fluorescent material I is D_s and an average particle diameter of the fluorescent material and/or the nonfluorescent material is D_w , $D_s > D_w$ is satisfied, the method comprising:

forming a layer of an organic material ~~such as a resin material~~ or an inorganic material ~~such as a metal material~~ on the photoelectric converting section of the pixel unit;

forming a temporary pixel of the ~~resin~~ organic material or the ~~metal~~ inorganic material by removing a portion, ~~which becomes the partition,~~ from the layer;

New National Phase Application of Kenichi ITO et al.

forming the partition by filling the portion removed ~~in the temporary pixel forming step~~ with a material containing the fluorescent material II and/or the fluorescent material III;
removing the temporary pixel; and

forming the scintillator pixels by filling the ~~portion where the temporary pixel is removed~~ removed pixels with a material containing the fluorescent material I.

13. (Currently Amended) A method for producing ~~the an~~ X-ray detector ~~according to any of claims 1 to 9, comprised of forming scintillator pixels on a photoelectric converting section of a pixel unit and forming a partition between the scintillator pixels, the method comprising a photoelectric converting section of a pixel unit, scintillator pixels containing a fluorescent material I formed on individual pixels of the photoelectric converting section, and a partition containing a fluorescent material and/or a nonfluorescent material disposed between the scintillator pixels, wherein, when an average particle diameter of the fluorescent material I is D_s and an average particle diameter of the fluorescent material and/or the nonfluorescent material is D_w , $D_s > D_w$ is satisfied, the method comprising:~~

forming a layer of an organic material ~~such as a resin material~~ or an inorganic material ~~such as a metal material~~ on the photoelectric converting section of the pixel unit;

forming a temporary partition of the ~~resin~~ organic material or the ~~metal~~ inorganic material by removing a portion ~~other than the portion, which becomes the partition,~~ from the layer;

forming the scintillator pixels by filling the portion removed ~~in the temporary partition forming step~~ with a material containing the fluorescent material I;

removing the temporary partition; and

forming the partition by filling the ~~portion where the~~ removed temporary partition is ~~removed~~ with a material containing a fluorescent material II and/or a fluorescent material III.

14. (New) The X-ray detector according to claim 2, wherein, when a thickness of the partition is T_w , an average particle diameter of the fluorescent material and/or the nonfluorescent material within the partition is D_w , and a packing density of the fluorescent material and/or the nonfluorescent material within the partition is F_w , $D_w \leq T_w \bullet F_w / 10$ is satisfied.

15. (New) The X-ray detector according to claim 14, wherein the scintillator pixels containing the fluorescent material I are formed of a sintered body of the fluorescent material I.

16. (New) The X-ray detector according to claim 8, wherein the longest wavelength of fluorescent light of the fluorescent material III is in an ultraviolet region.

17. (New) The method according to claim 12, wherein the organic material comprises a resin.

18. (New) The method according to claim 12, wherein the inorganic material comprises a metal.

19. (New) The method according to claim 13, wherein the organic material comprises a resin.

20. (New) The method according to claim 13, wherein the inorganic material comprises a metal.